



Infrastructure, environment, facilities

Mr. Steven Scharf, P.E.
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233-7015

Subject:

Discussion of Preliminary Results from the Off-Site Vertical Profile Boring Program, Phase 2 Groundwater Remedial Investigation, Former Grumman Settling Ponds (Operable Unit 3 – Bethpage Community Park), Bethpage, New York.

Dear Steve:

On behalf of Northrop Grumman Systems Corporation (NGC), ARCADIS is providing the New York State Department of Environmental Conservation (NYSDEC) with the enclosed validated groundwater analytical data and this preliminary discussion of findings pertaining to the Vertical Profile Boring (VPB) Program conducted as part of the Phase 2 Remedial Investigation/Feasibility Study (RI/FS) for the Bethpage Community Park in Bethpage, New York (hereinafter referred to as the Park). This letter report was prepared, in part, to satisfy the data reporting requirements pursuant to Section III of Administrative Order on Consent (AOC) Index # W1-0018-04-01. Additionally, this letter report was prepared on an expedited basis to present the NYSDEC with initial information regarding select results of the OU3 RI. The following sections of this letter report provide the background, discussion of findings, and a summary.

Background

Figure 1 (enclosed) provides the locations of key wells, VPBs, and portions of the project area referred to in this letter report. As NYSDEC is aware, ARCADIS is employing the VPB groundwater screening methodology (as specified in the approved OU3 RI/FS Work Plan) to investigate VOCs and other analytes in groundwater at various off-site locations south and southeast of the Park. This letter report presents the VOC groundwater analytical results from samples obtained from deep VPBs VP-100 and VP-104, the latter of which was completed approximately 5,400 ft downgradient of the Park and approximately 2,700 ft north-northwest of

Imagine the result

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9 November 2006

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Bethpage Water District (BWD) Plant 4. Drilling of these VPBs has been completed and the validated results of the groundwater samples collected and analyzed for volatile organic compounds (VOCs) are attached to this letter report (see Tables 1 and 2).

Concurrent with the NGC OU3 RI, the U.S. Navy is proposing to begin construction of the off-site groundwater remedy at the GM-38 Area. The GM-38 Area refers to an area of VOC-impacted groundwater that exists at depths of 300 to 500 feet below land surface (ft bls) located off-site, southeast of the main NGC/Navy sites. Remedial activities are being conducted by the Navy to satisfy provisions of the Record of Decision (ROD) for Operable Unit 2 (OU2) for the main NGC (NYSDEC Site #1-30-003A) and the Naval Weapons Industrial Reserve Plant (NWIRP) (NYSDEC Site #1-30-003B) sites. As ARCADIS understands the current status of construction of the GM-38 Area remedy, two remedial wells (RW-1 and RW-2) have been installed and the Town of Oyster Bay recently granted access to the Navy to drill a third remedial well (RW-3) and begin construction of the GM-38 Area groundwater pump-and-treat system main plant.

Discussion of Findings

In general, the currently available results of the OU3 RI performed to investigate VOCs in groundwater south of the Park appear to indicate the presence of two distinct VOC plumes south of the Park, which appear to be vertically separated by approximately 80 to 100 ft of aquifer in the VP-100 Area. Based on the depth encountered and, to a lesser extent, comparison to the chemical profile detected in groundwater samples collected beneath the Park to date, the shallower segment of off-site VOC-impacted groundwater appears to be associated with the Park. In contrast, the deeper segment of VOC-impacted groundwater exhibits a distinctly different chemical profile and, more importantly, was identified at a depth that indicates it may be more likely attributable to another source(s). A more detailed analysis of the data is as follows:

1. A relatively shallow zone (as defined below) of VOC-impacted groundwater exists beneath the Park and extends off-site a currently unknown distance. The main constituent of concern (COC) in this impacted zone is cis-1,2-dichloroethene (cis-1,2-DCE), although other VOCs are present at much lower concentrations. On average, cis-1,2-DCE accounts for approximately 80 percent of the total VOCs (TVOCs)

detected. This segment of VOC-impacted groundwater occurs at the water table (approximately 55 ft bls at the Park) at the Park and drops vertically in the aquifer as it moves away from the Park to the southeast (i.e., in the downgradient direction).

2. In VP-100, the highest concentration of cis-1,2-DCE was detected at a depth of 150 ft bls at a concentration of 1,500 micrograms per liter ($\mu\text{g/L}$). At this same interval, trichloroethene (TCE) was detected at 190 $\mu\text{g/L}$. The depth of this shallower segment of VOC-impacted groundwater is consistent with ARCADIS' expectations based on the rate of drop of the VOC plume between other VPBs downgradient of the Park. Additionally, at intervals of 270 to 275 and 290 to 295 ft bls, TCE was detected at 240 and 190 $\mu\text{g/L}$ while cis-1,2-DCE was detected at 8 and 7 $\mu\text{g/L}$; these depth intervals where these VOC concentrations were encountered are significantly deeper than expected based on other data collected and suggests that the deeper impacts arrived at VP-100 via a longer groundwater flow path than the shallower impacts. This suggests that the source of the deeper impacts did not originate in the Park.

3. In VP-104, TCE was detected at 150 $\mu\text{g/L}$ at a depth of 120 ft bls; cis-1,2-DCE was not detected. TCE was again detected in the interval from 480 to 580 ft bls at concentrations ranging from 72 $\mu\text{g/L}$ to 6,300 $\mu\text{g/L}$. Additionally, cis-1,2-DCE was also detected in this interval but at significantly lower concentrations, ranging from 6 to 470 $\mu\text{g/L}$. The depth interval where these latter concentrations were encountered is significantly deeper than expected and suggests that the source of VOC impacts to groundwater is not related to the Park.

4. The source(s) of the deep segment of VOC-impacted groundwater identified at VP-100 and VP-104 has not been identified. More importantly, the downgradient extent of the VOC impacted groundwater identified at VP-104 is not presently known. Delineation of the deeper plume is needed so groundwater modeling can be performed to determine the potential impacts to the GM-38 Area Remedial System.

Summary

The data analysis associated with the overall OU3 RI is ongoing and as ARCADIS learns more, ARCADIS' preliminary findings and conclusions described herein may change. However at this time, ARCADIS concludes that due to the depth and

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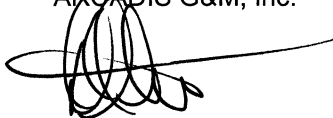
relative concentrations of COCs detected at VPBs VP-100 and VP-104, there is a shallower segment of VOC-impacted groundwater related to OU3 and a distinct, deeper segment of VOC-impacted groundwater that is related to a separate source(s).

Since the leading edge of the deeper segment of VOC-impacted groundwater is not presently known, the effect of the GM-38 Area Remedial System needs to be re-evaluated and the system modified, if necessary.

Feel free to contact us to discuss any of the above information if you have questions or need additional information.

Sincerely,

ARCADIS G&M, Inc.



David E. Stern
Senior Scientist



Carlo San Giovanni
Project Manager



Michael Wolfert
Project Director

Enclosures

Copies:

John Cofman, Northrop Grumman Corporation
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Susan Clarke, NAVFAC Midlant Environmental
Dave Bryack, TetraTech NUS, Inc.

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds
(Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 60 ft bls 7/28/2006	VP-104 80 ft bls 7/28/2006	VP-104 100 ft bls 7/31/2006	VP-104 120 ft bls 7/31/2006	VP-104 140 ft bls 7/31/2006	VP-104 REP 140 ft bls 7/31/2006	VP-104 160 ft bls 7/31/2006
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5	<5
2-Hexanone		<10	<10	<10	<10	<10	<10	<10
Acetone		<16	<10	<10	<10	<10	<10	<10
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Bromodichloromethane		<5	<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5	<5
Carbon disulfide		<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
Chloroethane		<5	<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5	<5
Chloromethane		<5	<5	<5	<5	<5	<5	<5
2-Butanone(MEK)		<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10	<10
Methylene chloride		<5	<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene		<5	<5	<5	<5	<5	<5	<5
Toluene		<5	<5	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Trichloroethylene		<5	1J	2J	150	8	10	19
trichlorotrifluoroethane		<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5	<5
Vinyl chloride		<2	<2	<2	<2	<2	<2	<2
Xylene (total)		<5	<5	<5	<5	<5	<5	<5

Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 180 ft bls 8/1/2006	VP-104 200 ft bls 8/1/2006	VP-104 220 ft bls 8/1/2006	VP-104 240 ft bls 8/1/2006	VP-104 260 ft bls 8/2/2006	VP-104 280 ft bls 8/2/2006	VP-104 300 ft bls 8/2/2006
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5	<5
2-Hexanone		<10	<10	<10	<10	<10	<10	<10
Acetone		<10	<10	<10	<10	<10	<10	<10
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Bromodichloromethane		<5	<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5	<5
Carbon disulfide		<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
Chloroethane		<5	<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethylene		<5	<5	1J	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5	<5
Chloromethane		<5	<5	<5	<5	<5	<5	<5
2-Butanone(MEK)		<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10	<10
Methylene chloride		<5	<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene		<5	<5	<5	<5	<5	<5	0.8J
Toluene		<5	<5	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Trichloroethylene		2J	3J	5J	7	7	7	2J
trichlorotrifluoroethane		<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5	<5
Vinyl chloride		<2	<2	<2	<2	<2	<2	<2
Xylene (total)		<5	<5	<5	<5	<5	<5	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 320 ft bls 8/3/2006	VP-104 340 ft bls 8/3/2006	VP-104 360 ft bls 8/3/2006	VP-104 380 ft bls 8/7/2006	VP-104 400 ft bls 8/7/2006	VP-104 420 ft bls 8/7/2006	VP-104 REP 420 ft bls 8/7/2006
1,1,1-Trichloroethane		<5	<5	<5	<5	3J	3J	3J
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		7	<5	<5	<5	10	11	11
1,1-Dichloroethylene		3J	<5	<5	<5	3J	4J	4J
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5	<5
2-Hexanone		<10	<10	<10	<10	<10	<10	<10
Acetone		<10	<10	<10	<11	<10	<10	<10
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Bromodichloromethane		<5	<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5	<5
Carbon disulfide		<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
Chloroethane		<5	<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	0.7J	0.7J	0.6J
cis-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5	<5
Chloromethane		<5	<5	<5	<5	<5	<5	<5
2-Butanone(MEK)		<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10	<10
Methylene chloride		<5	<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene		<5	<5	<5	<5	2J	2J	2J
Toluene		<5	<5	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Trichloroethylene		0.9J	<5	<5	<5	3J	3J	3J
trichlorotrifluoroethane		<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5	<5
Vinyl chloride		<2	<2	<2	<2	<2	<2	<2
Xylene (total)		<5	<5	<5	<5	<5	<5	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 460 ft bls 8/8/2006	VP-104 480 ft bls 8/8/2006	VP-104 500 ft bls 8/8/2006	VP-104 520 ft bls 8/14/2006	VP-104 540 ft bls 8/14/2006	VP-104 560 ft bls 8/14/2006	VP-104 580 ft bls 8/15/2006
1,1,1-Trichloroethane		<5	6	1J	<5	<25	<25	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<25	<25	<5
1,1,2-Trichloroethane		<5	<5	<5	3J	<25	5J	<5
1,1-Dichloroethane		<5	15	2J	3J	<25	<25	<5
1,1-Dichloroethylene		<5	9	2J	2J	4J	7J	<5
1,2-Dichloroethane		<5	<5	<5	16	<25	12J	<5
1,2-Dichloropropane		<5	<5	<5	<5	<200	<250	<5
2-Hexanone		<10	<10	<10	<10	<50	<50	<10
Acetone		<10	<10	<10	5J	<50	<50	<10
Benzene		<0.7	<0.7	<0.7	<0.7	<4	<4	<0.7
Bromodichloromethane		<5	<5	<5	<5	<25	<25	<5
Bromoform		<5	<5	<5	<5	<25	<25	<5
Carbon disulfide		<5	<5	<5	<5	<25	<25	<5
Carbon tetrachloride		<5	<5	<5	<5	<25	<25	<5
Chlorobenzene		<5	<5	<5	<5	<25	<25	<5
Chlorodifluoromethane		<5	<5	<5	<5	<25	<25	<5
Chloroethane		<5	<5	<5	<5	<25	<25	<5
Chloroform		<5	2J	6	<18	<25	<25	<5
cis-1,2-Dichloroethylene		<5	20	84	380D	470	290	6
cis-1,3-Dichloropropene		<5	<5	<5	<5	<25	<25	<5
Dibromochloromethane		<5	<5	<5	<5	<25	<25	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<25	<25	<5
trans-1,2-Dichloroethylene		<5	<5	<5	6	4J	5J	<5
Ethylbenzene		<5	<5	<5	<5	<25	<25	<5
Bromomethane		<5	<5	<5	<5	<25	<25	<5
Chloromethane		<5	<5	<5	<5	<25	<25	<5
2-Butanone(MEK)		<10	<10	<10	<10	<50	<50	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<50	<50	<10
Methylene chloride		<5	<5	<5	<5	<25	<25	<5
Styrene		<5	<5	<5	<5	<25	<25	<5
Tetrachloroethylene		<5	19	4J	12	3J	7J	<5
Toluene		<5	<5	<5	<5	<25	<25	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<25	<25	<5
Trichloroethylene		0.3J	72	190D	1400D	3200D	6300D	110
trichlorotrifluoroethane		<5	<5	<5	0.5J	<25	<25	<5
Vinyl Acetate		<5	<5	<5	<5	<25	<25	<5
Vinyl chloride		<2	<2	<2	<2	<10	<10	<2
Xylene (total)		<5	<5	<5	<5	<25	<25	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 600 ft bls 8/15/2006	VP-104 620 ft bls 8/15/2006	VP-104 640 ft bls 8/16/2006	VP-104 660 ft bls 8/16/2006	VP-104 680 ft bls 8/16/2006	VP-104 707 ft bls 8/21/2006	VP-104 720 ft bls 8/22/2006
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5	<5
2-Hexanone		<10	<10	<10	<10	<10	<10	<10
Acetone		<10	4J	<10	<10	<10	6J	<10
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Bromodichloromethane		<5	<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5	<5
Carbon disulfide		<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
Chloroethane		<5	<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethylene		1J	1J	<5	0.9J	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5	<5
Chloromethane		<5	<5	<5	<5	<5	<5	<5
2-Butanone(MEK)		<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10	<10
Methylene chloride		<5	<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene		<5	<5	<5	<5	<5	<5	<5
Toluene		<5	<5	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Trichloroethylene		17	14	8	11	4J	0.5J	1J
trichlorotrifluoroethane		<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5	<5
Vinyl chloride		<2	<2	<2	<2	<2	<2	<2
Xylene (total)		<5	<5	<5	<5	<5	<5	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: Sample Depth: Sample Date:	VP-104 740 ft bls 8/22/2006	VP-104 760 ft bls 8/23/2006	VP-104 780 ft bls 8/23/2006	VP-104 800 ft bls 8/23/2006	VP-104 820 ft bls 8/24/2006	VP-104 840 ft bls 8/24/2006	VP-104 860 ft bls 8/25/2006
1,1,1-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,1-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5	<5	<5	<5
2-Hexanone		<10	<10	<10	<10	<10	<10	<10
Acetone		<10	<10	5J	<10	<10	<10	5J
Benzene		<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
Bromodichloromethane		<5	<5	<5	<5	<5	<5	<5
Bromoform		<5	<5	<5	<5	<5	<5	<5
Carbon disulfide		<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5	<5	<5	<5
Chlorobenzene		<5	<5	<5	<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
Chloroethane		<5	<5	<5	<5	<5	<5	<5
Chloroform		<5	<5	<5	<5	<5	<5	<5
cis-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Dibromochloromethane		<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene		<5	<5	<5	<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5	<5	<5	<5
Chloromethane		<5	<5	<5	<5	<5	<5	<5
2-Butanone(MEK)		<10	<10	<10	<10	<10	<10	<10
4-Methyl-2-pentanone		<10	<10	<10	<10	<10	<10	<10
Methylene chloride		<5	<5	<5	<5	<5	<5	<5
Styrene		<5	<5	<5	<5	<5	<5	<5
Tetrachloroethylene		<5	<5	<5	<5	<5	<5	<5
Toluene		<5	<5	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene		<5	<5	<5	<5	<5	<5	<5
Trichloroethylene		1J	1J	0.9J	1J	0.3J	<5	<5
trichlorotrifluoroethane		<5	<5	<5	<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5	<5	<5	<5
Vinyl chloride		<2	<2	<2	<2	<2	<2	<2
Xylene (total)		<5	<5	<5	<5	<5	<5	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds
(Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Constituent in ug/L	Sample ID: VP-104 Sample Depth: 880 ft bls Sample Date: 8/25/2006
1,1,1-Trichloroethane	<5
1,1,2,2-Tetrachloroethane	<5
1,1,2-Trichloroethane	<5
1,1-Dichloroethane	<5
1,1-Dichloroethylene	<5
1,2-Dichloroethane	<5
1,2-Dichloropropane	<5
2-Hexanone	<10
Acetone	6J
Benzene	<0.7
Bromodichloromethane	<5
Bromoform	<5
Carbon disulfide	<5
Carbon tetrachloride	<5
Chlorobenzene	<5
Chlorodifluoromethane	<5
Chloroethane	<5
Chloroform	<5
cis-1,2-Dichloroethylene	<5
cis-1,3-Dichloropropene	<5
Dibromochloromethane	<5
Dichlorodifluoromethane	<5
trans-1,2-Dichloroethylene	<5
Ethylbenzene	<5
Bromomethane	<5
Chloromethane	<5
2-Butanone(MEK)	<10
4-Methyl-2-pentanone	<10
Methylene chloride	<5
Styrene	<5
Tetrachloroethylene	<5
Toluene	<5
trans-1,3-Dichloropropene	<5
Trichloroethylene	<5
trichlorotrifluoroethane	<5
Vinyl Acetate	<5
Vinyl chloride	<2
Xylene (total)	<5

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Table 1. Concentrations of VOCs Detected in Vertical Profile Boring VP-104, Former Grumman Settling Ponds
(Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Detections are boldfaced

- D Constituent quantified at secondary dilution
- J Estimated Value
- B Constituent detected in associated blank
- Not Analyzed

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (ug/l)	Sample ID: Sample Depth: Sample Date:	VP-100 VP-100(75-80) 9/14/2006	VP-100 VP-100(105-110) 9/14/2006	VP-100 VP-100(125-130) 9/13/2006	VP-100 VP-100(145-150) 9/13/2006
Chloromethane		<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5
Methylene chloride		<5B	<5B	<5	<5
Acetone		<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5
Chloroform		9	2J	0.7J	0.7J
1,2-Dichloroethane		<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5
Trichloroethene		17	22	97	190
Dibromochloromethane		<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5
Bromoform		<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10
Tetrachloroethene		<5	<5	<5	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5
Toluene		2J	1J	<5	<5
Chlorobenzene		<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5
Styrene		<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5
Chlorodifluoromethane		14	3J	<5	<5
cis-1,2-Dichloroethylene		100	140	930D	1500D
Dichlorodifluoromethane		<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	0.9J	<5
trichlorotrifluoroethane		<5	<5	<5	<5

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (ug/l)	Sample ID: Sample Depth: Sample Date:	VP-100 VP-100(160-165) 9/12/2006	VP-100 VP-100(180-185) 9/12/2006	VP-100 VP-100(190-195) 9/12/2006	VP-100 VP-100(200-205) 9/11/2006
Chloromethane		<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5
Vinyl Chloride		2J	<2	<2	<2
Chloroethane		<5	<5	<5	<5
Methylene chloride		<5	<5	<5	<5
Acetone		<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5
1,1-Dichloroethane		3J	<5	<5	<5
Chloroform		2J	<5	2J	0.6J
1,2-Dichloroethane		<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5
Trichloroethene		78	32	20	11
Dibromochloromethane		<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5
Bromoform		<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10
Tetrachloroethene		<5	<5	0.6J	<5
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5
Toluene		<5	<5	<5	0.8J
Chlorobenzene		<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5
Styrene		<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5
cis-1,2-Dichloroethylene		360D	66	16	11
Dichlorodifluoromethane		<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5
trichlorotrifluoroethane		<5	<5	<5	<5

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (ug/l)	Sample ID: Sample Depth: Sample Date:	VP-100 VP-100(210-215) 9/11/2006	VP-100 VP-100(220-225) 9/11/2006	VP-100 VP-100(230-235) 9/8/2006	VP-100 VP-100(240-245) 9/8/2006
Chloromethane		<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5
Methylene chloride		<5	<5	<5	<5
Acetone		<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5
Chloroform		<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5
Trichloroethene		15	14	20	47
Dibromochloromethane		<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5
Bromoform		<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10
Tetrachloroethene		<5	<5	2J	3J
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5
Toluene		<5	<5	1J	<5
Chlorobenzene		<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5
Styrene		<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5
Chlorodifluoromethane		2J	2J	<5	<5
cis-1,2-Dichloroethylene		22	17	3J	2J
Dichlorodifluoromethane		<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5
trichlorotrifluoroethane		<5	<5	<5	<5

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds
(Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (ug/l)	Sample ID: Sample Depth: Sample Date:	VP-100 VP-100(250-255) 9/7/2006	VP-100 VP-100(270-275) 9/7/2006	VP-100 VP-100(290-295) 9/6/2006	VP-100 VP-100(310-315) 9/6/2006
Chloromethane		<5	<5	<10	<5
Bromomethane		<5	<5	<10	<5
Vinyl Chloride		<2	<2	<4	<2
Chloroethane		<5	<5	<10	<5
Methylene chloride		<5	<5	<10	<5
Acetone		<10	<10	<20	<10
Carbon disulfide		<5	<5	<10	<5
1,1-Dichloroethene		<5	<5	<10	<5
1,1-Dichloroethane		<5	<5	<10	<5
Chloroform		<5	<5	<10	<5
1,2-Dichloroethane		<5	<5	<10	<5
2-Butanone		<10	<10	<20	<10
1,1,1-Trichloroethane		<5	<5	<10	<5
Carbon tetrachloride		<5	<5	<10	<5
Bromodichloromethane		<5	<5	<10	<5
1,2-Dichloropropane		<5	<5	<10	<5
cis-1,3-Dichloropropene		<5	<5	<10	<5
Trichloroethene		86	240D	190	18
Dibromochloromethane		<5	<5	<10	<5
1,1,2-Trichloroethane		<5	<5	<10	<5
Benzene		<0.7	<0.7	<1	<0.7
trans-1,3-Dichloropropene		<5	<5	<10	<5
Bromoform		<5	<5	<10	<5
4-Methyl-2-pentanone		<10	<10	<20	<10
2-Hexanone		<10	<10	<20	<10
Tetrachloroethene		2J	3J	<10	3J
1,1,2,2-Tetrachloroethane		<5	<5	<10	<5
Toluene		8	3J	1J	1J
Chlorobenzene		<5	<5	<10	<5
Ethylbenzene		<5	<5	<10	<5
Styrene		<5	<5	<10	<5
Xylene (total)		<5	<5	<10	<5
Vinyl Acetate		<5	<5	<10	<5
Chlorodifluoromethane		<5	<5	<10	<5
cis-1,2-Dichloroethylene		3J	8	7J	<5
Dichlorodifluoromethane		<5	<5	<10	<5
trans-1,2-Dichloroethene		<5	<5	<10	<5
trichlorotrifluoroethane		<5	<5	<10	<5

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

CONSTITUENT (ug/l)	Sample ID: Sample Depth: Sample Date:	VP-100 VP-100(330-335) 9/5/2006	VP-100 VP-100(350-355) 9/5/2006	VP-100 VP-100(371-376) 9/1/2006	VP-100 VP-100(394-399) 9/1/2006
Chloromethane		<5	<5	<5	<5
Bromomethane		<5	<5	<5	<5
Vinyl Chloride		<2	<2	<2	<2
Chloroethane		<5	<5	<5	<5
Methylene chloride		<5	<5	<5	<5
Acetone		<10	<10	<10	<10
Carbon disulfide		<5	<5	<5	<5
1,1-Dichloroethene		<5	<5	<5	<5
1,1-Dichloroethane		<5	<5	<5	<5
Chloroform		<5	<5	<5	<5
1,2-Dichloroethane		<5	<5	<5	<5
2-Butanone		<10	<10	<10	<10
1,1,1-Trichloroethane		<5	<5	<5	<5
Carbon tetrachloride		<5	<5	<5	<5
Bromodichloromethane		<5	<5	<5	<5
1,2-Dichloropropane		<5	<5	<5	<5
cis-1,3-Dichloropropene		<5	<5	<5	<5
Trichloroethene		11	2J	0.6J	1J
Dibromochloromethane		<5	<5	<5	<5
1,1,2-Trichloroethane		<5	<5	<5	<5
Benzene		<0.7	<0.7	<0.7	<0.7
trans-1,3-Dichloropropene		<5	<5	<5	<5
Bromoform		<5	<5	<5	<5
4-Methyl-2-pentanone		<10	<10	<10	<10
2-Hexanone		<10	<10	<10	<10
Tetrachloroethene		6	<5	0.5J	0.8J
1,1,2,2-Tetrachloroethane		<5	<5	<5	<5
Toluene		1J	<5	0.7J	<5
Chlorobenzene		<5	<5	<5	<5
Ethylbenzene		<5	<5	<5	<5
Styrene		<5	<5	<5	<5
Xylene (total)		<5	<5	<5	<5
Vinyl Acetate		<5	<5	<5	<5
Chlorodifluoromethane		<5	<5	<5	<5
cis-1,2-Dichloroethylene		<5	<5	<5	<5
Dichlorodifluoromethane		<5	<5	<5	<5
trans-1,2-Dichloroethene		<5	<5	<5	<5
trichlorotrifluoroethane		0.9J	<5	<5	0.7J

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Table 2. Concentrations of VOCs Detected in Vertical Profile Boring VP-100, Former Grumman Settling Ponds
(Operable Unit 3 - Bethpage Community Park), Bethpage, New York.

Detections are boldfaced

- D Constituent quantified at secondary dilution
- J Estimated Value
- B Constituent detected in associated blank
- Not Analyzed

Current Plotstyle : ByColor
Layout Tab: OU3

Acad Version : R17.0s (LMS Tech) Date\Time : Tue, 19 Sep, 2006 - 10:24am
User Name : alsanchez
Path\Name : C:\APROJECT\Northrop_Grumman\Cadd\OU3\OU3006001-OU3-Site_Navy_mtg.dwg



- EXPLANATION**
- PROPERTY BOUNDARY OF THE FORMER GRUMMAN AEROSPACE SITE
 - - - PROPERTY BOUNDARY OF U.S. NAVY SITE
 - ||||| LONG ISLAND RAILROAD
 - DENOTES NORTHROP GRUMMAN OWNED PROPERTY (AS OF 2003)
 - ▨ DENOTES U.S. NAVY OWNED PROPERTY (AS OF 2003)
 - ▩ RECHARGE BASIN
 - LAND SURFACE PROJECTION OF THE CAPTURE ZONE OF WELL ONCT 3 (WELL 19) PUMPING AT ITS NORMAL RATE OF 700 GPM (BASED ON MODELING)
 - ← CURRENT DIRECTION OF GROUNDWATER FLOW
 - - - LIMITS OF BETHPAGE HIGH SCHOOL MAIN BUILDING
 - 10592 ● OBSERVATION, MONITORING WELL (GRAY - SHOWN FOR REFERENCE) (BLACK - PROPOSED TO BE SAMPLED IN PHASE 2 RI)
 - 6781 ▲ INDUSTRIAL WELL
 - 9591 ● PUBLIC SUPPLY WELL
 - 4175 ● IRRIGATION WELL
 - WELL-17 ● NORTHROP GRUMMAN OR NAVY PRODUCTION WELL
 - GP-11 ● ABANDONED PRODUCTION WELL
 - VP-49 ● COMPLETED OU2 VERTICAL PROFILE BORING
 - VP-100 ● COMPLETED OU3 VERTICAL PROFILE BORING
 - VP-103 ○ PROPOSED OU3 VERTICAL PROFILE BORING
 - BWD BETHPAGE WATER DISTRICT
 - VPB VERTICAL PROFILE BORING
 - RI REMEDIAL INVESTIGATION
 - OU2 OPERABLE UNIT 2
 - OU3 OPERABLE UNIT 3

- GENERAL NOTES:**
- THIS FIGURE INCLUDES LOCATIONS OF PUBLIC SUPPLY WELLS BASED ON INFORMATION RECEIVED BY ARCADIS IN RESPONSE TO A SEPTEMBER 2001 LETTER TO WATER DISTRICTS.
 - BASIN LOCATIONS OBTAINED FROM USGS TOPOGRAPHIC MAPS (HUNTINGTON, HICKSVILLE, FREEPORT AND AMITYVILLE QUADRANGLES) AND INFORMATION PROVIDED BY NORTHROP GRUMMAN.
 - NORTHROP GRUMMAN PROPERTY HOLDINGS BASED ON DATA PROVIDED IN JUNE 2003.
 - LOCATIONS OF MONITORING WELLS INSTALLED BY DVIRKA & BARTILUCCI (D&B) AT PLANT 1 (i.e., MW-1 TO MW-6) ARE APPROXIMATE BASED ON D&B SITE PLAN, PROVIDED ON DECEMBER 19, 2002.
 - LOCATIONS OF MONITORING WELLS INSTALLED BY DVIRKA & BARTILUCCI (D&B) AT BETHPAGE COMMUNITY PARK ARE APPROXIMATE BASED ON DATA PROVIDED BY D&B SITE PLAN, DATED DECEMBER 2003.
 - LOCATIONS OF BETHPAGE PARK MONITORING WELLS INSTALLED BY THE TOWN OF OYSTER BAY ARE APPROXIMATE, BASED ON THE 2005 H2M REPORTS. (H2M 2005a;b).



NO.	ISSUED DATE	REVISION DESCRIPTION	BY/CHK
KEYPLAN			

PROJECT TITLE

**OPERABLE UNIT 3
NORTHROP GRUMMAN
SYSTEMS CORPORATION
BETHPAGE, NEW YORK**

SHEET TITLE

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EXTENTS AND FEATURES
DVIRKA AND BARTILUCCI
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